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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/688,460	10/17/2003	Alexander E. Andreev	03-2065/L13.12-0255	3008

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Leo J. Peters  
LSI Logic Corporation  
MS D-106  
1621 Barber Lane  
Milpitas, CA 95035

EXAMINER
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DINH, PAUL

ART UNIT	PAPER NUMBER
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2825

DATE MAILED: 11/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/688,460

Applicant(s)

ANDREEV ET AL.

Examiner

Paul Dinh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 November 2005.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1,2,7-13 and 18-21 is/are rejected.  
7) ☒ Claim(s) 3-6 and 14-17 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 10/17/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_

Paul Dinh

### DETAILED ACTION

This FINAL OFFICE action is a response to the amendment filed on 11/2/05.

Claims 1-21 are pending.

#### Claim Objection

Claim 1 is objected to because “the initial object assignment procedure” lacks antecedent basis.

Claims 2-3 and 13-14 are objected to because “points”, “point” and “midpoint” and “matching assignment” are not clear as to what points/point or points/point of what, what “midpoint” or midpoint between what, and matching what or matching what to what.

Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims.

Correction is required.

No new matter should be entered.

#### Claim Rejections - 35 USC § 102

*The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:*

*A person shall be entitled to a patent unless –*

*(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.*

Claims 1-2, 7, 11-13 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Wang et al (USP 5818729)

(Claims 1 and similarly recited claims 12)

a) Creating initial object assignment to points of a first rectangle;

(Col 2 line 20, fig 7-8, initial object assignment is one or more of: initial cell/module/elements/object assigning/placement/allocation/partition, rough assigning/placement/allocation of cells/modules/elements/objects and first (or initial) connectivity matrices for the multi-pin nets as taught in, i.e., see one or more of: abstract, summary col 6, 8, 11-12; the terms objects, elements, cell, rectangular modules are used interchangeably in this prior art (i.e., col 1-2, col 8 line 60) and the terms assigning, placement, allocation, partition are used interchangeably in this prior art (i.e., col 1-2, 8 ))

b) Dividing the first rectangle into a plurality second rectangles (fig 7); and

c) Applying an object assignment procedure, which is different than the initial object assignment procedure, to the initially assigned objects each second rectangle.

(See one or more of: abstract line 14+, col 3 lines 2-12, col 6 lines 18-45, col 11 lines 29-30, col 12 lines 8-57, col 13 lines 33-36, fig 6-7, 10).

(Claims 2, 13) wherein step a) comprises: a1) calculating a maximal cost of assignment of objects to points (col 1 lines 28-35), and a2) selecting an assignment of objects having a minimum value of maximal cost (col 1 lines 28-35).

(Claims 7, 18) wherein the dividing of the first rectangle is performed so that each point in the first rectangle is in at least two second rectangles (fig 7-8).

(Claim 11) iteratively repeating step c) until occurrence of a predetermined event (one or more of: fig 6-7, 10, col 6 lines 41-46).

### ***Claim Rejections - 35 USC § 103***

*The following is a quotation of 35 U.S.C. 103(a), which forms the basis for all obviousness rejections, set forth in this Office action:*

*(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.*

Claims 8-10 and 19-21 and are rejected under 35 U.S.C. 103(a) as being Unpatentable over Wang et al (USP 5818929) in view of one or more of: admission in the present application, the prior art of record La Mura (US patent application Publication # 2005/0038728) and Hill et al (US patent application Publication # 2004/0166864)

Wang discloses substantially all the elements in claims 8-10 and 19-21 except using Kuhn's algorithm for object assignment.

- This present application admits that using Kuhn's algorithm for object assignment is well known in paragraph 0010

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- La Mura discloses using Kuhn's algorithm for object assignment/allocation in para 0073.
- Hill discloses using Kuhn's algorithm for object assignment/allocation in para 0139.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use Kuhn's algorithm for object assignment/allocation simply because (one or more of the followings):

Using Kuhn's algorithm for object assignment/allocation Kuhn's is well-known in the art as admitted in paragraph 0010 of the present application; and

Using Kuhn's algorithm for object assignment/allocation is known in the art as taught by La Mura in paragraph 0073, i.e.,

"An appropriate computation is performed on the matrix to solve the underlying linear assignment problem and find an efficient allocation of the properties. (Step 1110) many appropriate methods, which are capable of solving a linear assignment problem in polynomial time (including Kuhn's algorithm, or Matching algorithms for weighted bipartite graphs, or linear programming algorithms) are known in the literature"; and

Using Kuhn's algorithm for object assignment/allocation is known in the art as taught by Hill in paragraph 0139, i.e.,

"Having created the weighted bipartite graph, a maximum matching whose sum of edge weights is maximized is now determined. This is referred to in the art as an "Optimal Assignment Problem". The use of bipartite graphs and ways to find a maximum (weighted) matching in bipartite graphs is well known, and is described in "Graph theory with Applications" by Bondy J. A., and Murty U. S. R Elsevier, North Holland 1976. One way of finding maximum weighted matching is to use the known Kuhn-Munkres algorithm".

Applicant's arguments with respect to claims 1-21 have been considered but are moot in view of the new ground(s) of rejection.

#### ***Allowable Subject Matter***

Claims 3-6 and 14-17 are objected to as being dependent upon a rejected base claim, but would be allowable if:

- a. Rewritten to overcome above-mention claim objections, and

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b. Rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 3-6 and 14-17 would be allowable because the prior art of record does not teach or suggest the limitations in:

Claim 3 and similarly recited claim 14; and

Claim 6 and similarly recited claim 17.

### **Conclusion**

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Dinh whose telephone number is 571-272-1890. The examiner can normally be reached on Monday to Friday from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Paul Dinh  
Patent Examiner

A handwritten signature in black ink that reads "Paul Dinh". The signature is written in a cursive style with a long, sweeping underline.